Claims:

1. An optical add-drop multiplexer comprising:

   an optical switch having an input port for inputting a multiplexed signal stream;

   a first channel assembly optically connected with the optical switch for transmitting the multiplexed signal stream;

   a reflector reflecting the multiplexed signal stream received from the first channel;

   an optical extractor having a thin film filter receiving the multiplexed signal stream reflected from the reflector, and dividing the stream into a signal to be extracted and remaining signals, the remaining signals being directed to the reflector from the filter; and

   a multiplexer optically connected with the second channel assembly and combining the remaining signals with an added signal into a multiplexed signal stream.

2. The optical add-drop multiplexer according to claim 1, wherein the first and second channel assemblies each have a plurality of optical fibers and corresponding collimating lenses respectively optically connected with the optical fibers.

3. The optical add-drop multiplexer according to claim 1, wherein the reflector is a concave mirror reflector.

4. The optical add-drop multiplexer according to claim 1, wherein the reflector comprises a glass body having a paraboloid surface, and a high reflective layer applied on the paraboloid surface.

5. A method of extracting a selected channel from a multiplexed signal stream containing a plurality of channels, the method comprising the steps of:

(1) providing a reflector and directing the multiplexed signal stream onto the reflector;

(2) providing a thin film filter which receives the multiplexed signal stream reflected from the reflector and divides the signal stream into the selected channel and remaining channels; and

(3) directing the remaining channels of the signal stream onto the reflector.

6. The method according to claim 5, wherein the reflector is a concave mirror reflector.

7. The method according to claim 5, wherein the reflector comprises a glass body having a paraboloid surface, and a high reflective layer applied on the paraboloid surface.

8. An optical device comprising:

an optical switch for switching to a channel to be extracted, the switch having an input port for inputting a multiplexed signal stream and a plurality of output ports, with one output port corresponding to the channel to be extracted and remaining output ports corresponding to other channels;

a first channel assembly optically connected with the output ports of the optical switch and emitting the multiplexed signal stream received from said one output port;

a reflector reflecting the multiplexed signal stream emitted from the first channel assembly; and

an optical thin film filter receiving the multiplexed signal stream from the reflector and dividing the multiplexed signal stream into a signal corresponding to the channel to be extracted and remaining signals corresponding to the other channels, the remaining signals being directed to the reflector from the optical thin film filter.

9. The optical device according to claim 8, wherein the first channel assembly comprises a plurality of optical fibers optically connected with the optical switch, and corresponding collimating lenses respectively optically connected with the optical fibers.

10. T he optical device according to claim 8, wherein the reflector is a concave mirror reflector.

11. T he optical device according to claim 8, wherein the reflector comprises a glass body having a paraboloid surface, and a high reflective layer applied on the paraboloid surface.

12. The optical device according to claim 8, further comprising a second channel assembly receiving the remaining signals reflected from the reflector.

13. The optical device according to claim 12, further comprising a multiplexer optically connected with the second channel assembly and combining the remaining signals with an added signal into a multiplexed signal stream.

14. A switchable add-drop multiplexer system comprising:

an optical switch adapted to transmit a light from a same source to different positions;

a first channel assembly connected to said optical switch to provide a plurality of parallel light paths corresponding to said different positions;

an optical device configured to converge said parallel light paths into a focal point; and

an optical extractor positioned at said focal point for dropping a signal of a desired wavelength.

15. The multiplexer according to claim 14, further including a second channel assembly opposite to said first channel assembly relative to

said focal point, said second channel assembly defining a plurality of parallel light paths receiving light emitted from the first channel assembly and reflected by said extractor.

16. The multiplexer according to claim 15, wherein said light received by the second channel assembly is reflected by the optical device twice, one before reflected by the extractor and the other after reflected by the extractor.

17. The multiplexer according to claim 14, wherein a filter is formed on extractor.

18. A method of switchably dropping different signals with different center wavelengths, comprising the steps of:

providing an optical switch defining a plurality of different output positions;

providing a first channel assembly defining a plurality of different light paths corresponding to said different positions, respectively;

providing an extractor with a filter; and

providing means for guiding the different light paths toward said extractor at different incident angles for dropping the signals with the different center wavelengths exclusively according to the different incident angles, respectively.

19. The method according to claim 18, wherein said means further guiding the different light paths which are reflected by said extractor toward a second channel assembly.

20. The method according to claim 18, wherein the light paths leaving from the first channel assembly and the light paths entering the second channel assembly are in a mutual parallel relationship.

21. The method according to claim 18, wherein said switch receives a single light source.